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EXAMINER	
CHAU, COREY P	

ART UNIT	PAPER NUMBER
2644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/393,463	WOODS, WILLIAM S.	
	Examiner	Art Unit	
	Corey P. Chau	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/14/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-50 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-49 of copending Application No. 10/731915. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant Claims 1-50 falls entirely within the scope of Claims 1-49 of Application No. 10/731915 or, in other words

the instant Claims 1-50 are obvious over Claims 1-49 of Application No. 10/731915. The instant Claims 1-50 is a broader version of Claims 1-49 of Application No. 10/731915 and is therefore obvious of Claims 1-49 of Application No. 10/731915

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4, 6 and 7 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 4 recites the limitation "the inhibiting filter" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is unclear to the Examiner what is "the inhibiting filter" referring to.

6. The term "about" in claims 6 and 7 is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6353671 to Kandel (hereafter as Kandel).

9. Regarding Claim 1, Kandel discloses a method of processing audio signals (i.e. signal processing circuit and method for increasing speech intelligibility), comprising inhibiting at least one feedback component of an input audio signal by adjusting a feedback-inhibiting filter (Fig. 4; column 5, line 57 to column 6, line 5; column 9, lines 50-57) using a narrowband subaudible probe signal (Fig. 4; column 6, lines 19-24; column 10, lines 12-25; column 12, lines 1-4).

10. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6594365 to Eatwell.

11. Regarding Claim 1, Eatwell discloses a method of processing audio signals, comprising inhibiting at least one feedback component of an input audio signal by adjusting a feedback-inhibiting filter (Fig. 2; column 5, line 66 to column 6, line 64) using a narrowband subaudible probe signal (column 5, lines 45-65; column 6, lines 27-41).

12. Claims 1-2, 5-15, 17-18, 20, 22, 25, 28-29, 34, 36, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5506910 to Miller et al. (hereafter as Miller).

13. Regarding Claim 1, Miller discloses a method of processing audio signals, comprising inhibiting at least one feedback component of an input audio signal by adjusting a feedback-inhibiting filter (Fig. 3; column 7, lines 9-19) using a narrowband subaudible probe signal (Fig. 1; column 4, line 64 to column 5, line 35).

14. Regarding Claim 2, Miller discloses a method of processing at least one audio signal comprising: filtering a processed signal by a notch filter to form a filtered signal (Fig. 1; column 4, lines 47-63); and sending a subaudible narrowband signal having a first bandwidth into the filter signal to form a probe signal to probe a feedback path having a second bandwidth (Fig. 1; column 4, line 64 to column 5, line 35).

15. Regarding Claim 5, Miller discloses sending the subaudible narrowband signal comprises sending the subaudible narrowband signal having a level, wherein the level

of the subaudible narrowband signal is determined using an audibility model (Fig. 1; column 4, line 64 to column 5, line 35).

16. Regarding Claim 6, as best understood with regards to the 112, 2nd problem mentioned above, Miller does discloses sending the subaudible narrowband signal comprises sending the subaudible narrowband signal at a level determined by an audibility model, wherein the audibility model has a criterion level, and wherein the level of the subaudible narrowband signal is adjusted so as to be **about** the criterion level of the audibility model (Fig. 1; column 4, line 64 to column 5, line 35).

17. Regarding Claim 7, as best understood with regards to the 112, 2nd problem mentioned above, Miller discloses wherein sending the subaudible narrowband signal comprises sending the subaudible narrowband signal at a level determined by an audibility model, wherein the audibility model has a criterion level, and wherein the level of the subaudible narrowband signal is adjusted so as to be **about** below the criterion level of the audibility model (Fig. 1; column 4, line 64 to column 5, line 35).

18. Regarding Claim 8, Miller discloses a system for enhancing audio signals, the system comprising:

at least one detector to detect undesired feedback in an input signal (Fig. 1; column 3, lines 32-60);

at least one notch filter to filter a processed signal, wherein the at least one notch filter provides a filtered signal (Fig. 1; column 4, lines 47-63) and the processed signal is provided by processing the input signal (Fig. 1); and

at least one probe generator to generate a probe signal and the filtered signal used to probe a feedback path with a narrowband subaudible audio probe signal (Fig. 1; column 4, line 64 to column 5, line 35).

19. Regarding Claim 9, Miller discloses the at least one detector determines when the feedback path will be probed (Fig. 1; column 3, lines 32-60).

20. Regarding Claim 10, Miller discloses the at least one detector determines a range of frequencies at which the feedback path will be probed (Fig. 1; column 3, lines 32-60).

21. Regarding Claim 11, Miller discloses the at least one detector provides a feedback parameter, and wherein the at least one notch filter is receptive to the feedback parameter from the at least one detector (Fig. 1; column 3, lines 32-60).

22. Regarding Claim 12, Miller discloses the at least one detector provides a plurality of feedback parameters, and wherein the at least one notch filter is receptive to the plurality of feedback parameters from the at least one detector (Fig. 1; column 3, lines 32-60).

23. Regarding Claim 13, Miller discloses the at least one notch filter has a first bandwidth, wherein the undesired feedback has a second bandwidth, and wherein the at least one notch filter is configured so as to center the first bandwidth of the at least one notch filter on the second bandwidth of the undesired feedback (Fig. 1; column 3, lines 32-60; column 4, lines 47-63).

24. Regarding Claim 14, Miller discloses the at least one probe generator has a first bandwidth, wherein the feedback path has a second bandwidth, and wherein the at

least one probe generator is configured so as to center the first bandwidth of the at least one probe generator on the second bandwidth of the feedback path (Fig. 1; column 3, lines 32-60; column 4, line 64 to column 5, line 35).

25. Regarding Claim 15, Miller discloses the at least one probe generator generates a plurality of signals that are combined to form a probe signal to probe a feedback path (Fig. 1; column 4, line 64 to column 5, line 35).

26. Regarding Claim 17, Miller discloses a signal processor to provide the processed signal (Fig. 1).

27. Regarding Claim 18, Miller discloses the signal processor includes a compressive amplifier (Fig. 1; column 3, lines 32-60).

28. Regarding Claim 20, Miller discloses a filter adjuster to adjust a filter by providing a set of filter coefficients (Fig. 3; column 7, lines 9-19).

29. Regarding Claim 22, Miller discloses an inhibiting filter receptive to the set of filter coefficients from the filter adjuster to inhibit at least one feedback component of the input signal (Fig. 3; column 7, lines 9-19).

30. Claim 25 is essentially similar to Claim 8 and is rejected for the reasons stated above apropos to Claim 8 (Fig. 1; column 4, line 64 to column 5, line 35).

31. Regarding Claim 28, Miller discloses the signal generator is a sinusoidal generator (Fig. 1; column 4, line 64 to column 5, line 35).

32. Regarding Claim 29, Miller discloses the signal generator is a narrowband noise generator (Fig. 1; column 4, line 64 to column 5, line 35).

33. Regarding Claim 34, Miller discloses the frequency signal is a constant value (Fig. 1; column 4, line 64 to column 5, line 35).

34. Claim 36 is essentially similar to Claims 8, 22, and 25 and is rejected for the reasons stated above apropos to Claims 8, 22, and 25.

35. Regarding Claim 40, Miller discloses a filter adjuster to adjust an inhibiting filter to inhibit the undesired feedback by providing a set of filter coefficients, the filter adjuster comprising: a modeler receptive to a feedback indicator parameter, the input signal, and an output signal to model at least one response of the feedback path when the feedback path is probed with the narrowband subaudible audio probe signal at a predetermined frequency, wherein the modeler provides at least one sample that is representative of the at least one response of the feedback path (Fig. 1; column 4, line 64 to column 5, line 35)

Claim Rejections - 35 USC § 103

36. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

37. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6496581 to Finn et al. (hereafter as Finn).

38. Regarding Claim 1, Finn discloses a method of processing audio signals (Fig. 8), comprising inhibiting at least one feedback component of an input audio signal by

adjusting a feedback-inhibiting filter (Fig. 8; column 15, lines 17-36) using a narrowband probe signal (400,430). Finn does not expressly the narrowband probe signal being subaudible. However, the Examiner takes Official Notice that it would have been obvious to one having ordinary skill in the art to have the narrowband probe signal be subaudible in order to reduce undesired signals heard by the user. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Finn to provide a subaudible narrowband probe signal in order to reduce undesired signals heard by the user.

39. Regarding Claim 2, Finn discloses a method of processing at least one audio signal (Fig. 7) comprising: filtering a processed signal by a notch filter to form a filtered signal (column 2, lines 36-53; column 14, line 4 to column 15, line 3).

Finn does not expressly disclose sending a subaudible narrowband signal having a first bandwidth into the filter signal to form a probe signal to probe a feedback path having a second bandwidth.

Finn discloses an acoustic feedback tonal canceler is provided, removing tonal noise from the output of the microphone to prevent broadcast thereof by a remote but acoustically coupled loudspeaker. Feedback tonal canceler (390,420) includes a summer (392,422) having an input (394,424) from microphone (36,38), an input (396,436) from feedback detector (398,428) and tone generator (400,430) supplied through adaptive filter model (402,432) (i.e. sending a narrowband signal having a first bandwidth into the filter signal to form a probe signal to probe a feedback path having a second bandwidth)(Fig. 8), and an output (404,434) to loudspeaker (34,32) through

summer (90,106). Model (402,432) has a model input (406,436) from tone generator (400,430), a model output (408,438) supplying a correction signal to summer input (396,426), and an error input (410,440) from summer output (404,434) (Fig. 8; column 2, lines 54-57; column 15, lines 4-36).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Finn with the teaching of Finn to incorporate an acoustic feedback tonal canceler in order to removing tonal noise from the output of the microphone to prevent broadcast thereof by a remote but acoustically coupled loudspeaker. Therefore, Finn as modified includes a summer (392,422) having an input from the adjustable notch filter (356,376), wherein the adjustable notch filter has filtered the output of the microphone (36,38), an input (396,436) from feedback detector (350,370) and tone generator (400,430) supplied through adaptive filter model (402,432), wherein the feedback detect (350,370) has an input (352,372) from the microphone (36,38), and an output (354,374) controlling the adjustable notch filter (356,376) filtering the output of the microphone (36,38) supplied to loudspeaker (34,32), and an output (404,434) to loudspeaker (34,32) through summer (90,106). Model (402,432) has a model input (406,436) from tone generator (400,430), a model output (408,438) supplying a correction signal to summer input (396,426), and an error input (410,440) from summer output (404,434).

Finn as modified does not expressly the narrowband signal being subaudible. However, the Examiner takes Official Notice that it would have been obvious to one having ordinary skill in the art to have the narrowband signal be subaudible in order to

reduce undesired signals heard by the user. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Finn to provide a subaudible narrowband signal in order to reduce undesired signals heard by the user.

40. Regarding Claim 3, Finn as modified comparing the probe signal to an input signal and adjusting selectively an inhibiting filter so as to inhibit at least one audio artifact associated with the feedback path (Fig. 8; column 15, lines 4-16).

41. Regarding Claim 4, Finn as modified discloses turning off selectively the operation of the notch filter when the inhibiting filter is adjusted (column 14, lines 4-49).

42. Regarding Claim 5, Finn as modified discloses sending the subaudible narrowband signal comprises sending the subaudible narrowband signal having a level, wherein the level of the subaudible narrowband signal is determined using an audibility model (i.e. it is inherent the tone generator generates a tone with a level)(Figs. 7 and 8).

43. Regarding Claim 6, as best understood with regards to the 112, 2nd problem mentioned above, Finn as modified does not expressly disclose sending the subaudible narrowband signal comprises sending the subaudible narrowband signal at a level determined by an audibility model, wherein the audibility model has a criterion level, and wherein the level of the subaudible narrowband signal is adjusted so as to be **about** the criterion level of the audibility model. Finn disclose a training noise to be imperceptible by the occupant yet have a sufficient signal to noise ratio for accurate model convergence (column 2, lines 7-14; column 10, lines 22-38). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Finn as modified with the teaching of Finn to have the tone generator to

generate a tone signal, which have a sufficient signal to noise ratio for accurate model convergence.

44. Regarding Claim 7, as best understood with regards to the 112, 2nd problem mentioned above, Finn as modified discloses wherein sending the subaudible narrowband signal comprises sending the subaudible narrowband signal at a level determined by an audibility model, wherein the audibility model has a criterion level, and wherein the level of the subaudible narrowband signal is adjusted so as to be **about** below the criterion level of the audibility model (column 10, lines 54-67).

45. Claims 8-23, 25, 28-29, 34, 36, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6496581 to Finn in view of U.S. Patent No. 5677987 to Seki et al. (hereafter as Seki).

46. Regarding Claim 8, Finn discloses a system for enhancing audio signals, the system (Fig. 7) comprising: at least one detector to detect undesired feedback in an input signal (350,370); at least one notch filter, wherein the at least one notch filter provides a filtered signal (Fig. 7; column 14, lines 4-67).

Finn does not expressly disclose a processed signal wherein the processed signal is provided by processing the input signal.

Seki discloses a compressor/limiter for limiting the amplitude an input signal in order to avoid damaging equipment such as speaker (Fig. 16; column 4, lines 10-21). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a compressor/limiter for limiting the amplitude the

input signal in order to avoid damaging equipment such as speaker (i.e. a processed signal wherein the processed signal is provided by processing the input signal, therefore the at least one notch filter filters the processed signal).

Finn does not expressly disclose at least one probe generator to generate a probe signal and the filtered signal used to probe a feedback path with a narrowband audio probe signal.

Finn discloses an acoustic feedback tonal canceler is provided, removing tonal noise from the output of the microphone to prevent broadcast thereof by a remote but acoustically coupled loudspeaker. Feedback tonal canceler (390,420) includes a summer (392,422) having an input (394,424) from microphone (36,38), an input (396,436) from feedback detector (398,428) and tone generator (400,430) supplied through adaptive filter model (402,432) (i.e. at least one probe generator to generate a probe signal and the filtered signal used to probe a feedback path with a narrowband audio probe signal)(Fig. 8), and an output (404,434) to loudspeaker (34,32) through summer (90,106). Model (402,432) has a model input (406,436) from tone generator (400,430), a model output (408,438) supplying a correction signal to summer input (396,426), and an error input (410,440) from summer output (404,434) (Fig. 8; column 2, lines 54-57; column 15, lines 4-36).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Finn with the teaching of Finn to incorporate an acoustic feedback tonal canceler in order to removing tonal noise from the output of the microphone to prevent broadcast thereof by a remote but acoustically coupled

loudspeaker. Therefore, Finn as modified includes a summer (392,422) having an input from the adjustable notch filter (356,376), wherein the adjustable notch filter has filtered the output of the microphone (36,38), an input (396,436) from feedback detector (350,370) and tone generator (400,430) supplied through adaptive filter model (402,432), wherein the feedback detect (350,370) has an input (352,372) from the microphone (36,38), and an output (354,374) controlling the adjustable notch filter (356,376) filtering the output of the microphone (36,38) supplied to loudspeaker (34,32), and an output (404,434) to loudspeaker (34,32) through summer (90,106). Model (402,432) has a model input (406,436) from tone generator (400,430), a model output (408,438) supplying a correction signal to summer input (396,426), and an error input (410,440) from summer output (404,434).

Finn does not expressly the narrowband audio probe signal being subaudible. However, the Examiner takes Official Notice that it would have been obvious to one having ordinary skill in the art to have the narrowband audio probe signal be subaudible in order to reduce undesired signals heard by the user. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Finn to provide a narrowband audio probe signal be subaudible in order to reduce undesired signals heard by the user.

47. Regarding Claim 9, Finn as modified discloses the at least one detector determines when the feedback path will be probed (column 14, lines 4-49; column 15, lines 4-16).

48. Regarding Claim 10, Finn as modified discloses the at least one detector determines a range of frequencies at which the feedback path will be probed (column 14, lines 4-49; column 15, lines 4-16).

49. Regarding Claim 11, Finn as modified discloses the at least one detector provides a feedback parameter, and wherein the at least one notch filter is receptive to the feedback parameter from the at least one detector (Fig 7; column 14, lines 4-49; column 15, lines 4-16).

50. Regarding Claim 12, Finn as modified discloses the at least one detector provides a plurality of feedback parameters, and wherein the at least one notch filter is receptive to the plurality of feedback parameters from the at least one detector (column 14, lines 4-49).

51. Regarding Claim 13, Finn as modified discloses the at least one notch filter has a first bandwidth, wherein the undesired feedback has a second bandwidth, and wherein the at least one notch filter is configured so as to center the first bandwidth of the at least one notch filter on the second bandwidth of the undesired feedback (Fig. 7; column 14, lines 4-67).

52. Regarding Claim 14, Finn as modified discloses the at least one probe generator has a first bandwidth, wherein the feedback path has a second bandwidth, and wherein the at least one probe generator is configured so as to center the first bandwidth of the at least one probe generator on the second bandwidth of the feedback path (column 15, lines 4-36).

53. Regarding Claim 15, Finn as modified discloses a sine ware or multiple sine waves can be generated (i.e. the at least one probe generator generates a plurality of signals)(column 15, lines 4-16), but does not expressly disclose the plurality of signals are combined to form a probe signal to probe a feedback path. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made that when multiple sine waves are generated the multiple sine waves would be combined at a summer as taught by Finn in Fig. 5 to produce a probe signal.

54. All elements of Claim 16 are comprehended by Claim 8. Claim 16 is rejected for the reasons stated above apropos to Claim 8.

55. All elements of Claim 17 are comprehended by Claim 8. Claim 17 is rejected for the reasons stated above apropos to Claim 8.

56. All elements of Claim 18 are comprehended by Claim 8. Claim 18 is rejected for the reasons stated above apropos to Claim 8.

57. Regarding Claim 19, Finn as modified discloses once the filter has been applied, the observation of the acoustic feedback should vanish, however hysteresis in the measurement process should be applied to not encourage cycling of the feedback reduction. Long term statistics of the feedback treatment process can be utilized for determining if the notch filter could be removed from the communication channel (column 14, lines 4-49), but does not expressly disclose a switch to provide an output signal, wherein the switch is receptive to the processed signal and a combined signal, wherein the combined signal includes a combination of the probe signal and the filtered signal. However, the Examiner take Official Notice that it would have been obvious to

provide a switch to turn on/off the feedback reduction or switch between normal mode and feedback reduction when the detector determines that it is not necessary for feedback reduction which will remove the notch filter and sine wave or multiple sine waves (i.e. probe signal) from the communication channel when the switch is turned off or in normal mode in order to reduce processing to occur when it is not necessary. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Finn as modified to incorporate a switch to provide the flexible to remove the notch filter and sine wave or multiple sine waves (i.e. probe signal) from the communication channel when the switch is turned off or in normal mode in order to reduce processing to occur when it is not necessary. Therefore, Finn as modified discloses a switch receptive to the processed signal and a combined signal, wherein the combined signal includes a combination of the probe signal and the filtered signal.

58. Regarding Claim 20, Finn as modified discloses a filter adjust a filter by providing a set of filter coefficients (Fig. 8; column 15, lines 4-16).

59. Regarding Claim 21, Finn as modified discloses the filter adjuster is configured to compare the input signal and an output signal to determine amplitude and phase responses of the feedback path, wherein the output signal includes a combination of the probe signal and the filtered signal (column 4, lines 48-67; column 15, lines 4-16).

60. Regarding Claim 22, Finn as modified discloses an inhibiting filter receptive to the set of filter coefficients from the filter adjuster to inhibit at least one feedback component of the input signal (column 15, lines 4-14)

61. Regarding Claim 23, Finn as modified discloses the inhibiting filter approximates the response of the feedback path to provide at least one feedback component signal, wherein the at least one feedback component signal is subtracted from the input signal (Figs. 7 and 8).

62. Claim 25 is essentially similar to Claim 8 and is rejected for the reasons stated above apropos to Claim 8 (Figs. 7 and 8; column 15, lines 4-36).

63. Regarding Claim 28, Finn as modified discloses the signal generator is a sinusoidal generator (Fig. 8; column 15, lines 4-16).

64. Regarding Claim 29, Finn as modified discloses the signal generator is a narrowband noise generator (Fig. 8; column 15, lines 4-16).

65. Regarding Claim 34, Finn as modified discloses the frequency signal is a constant value (Fig. 8; column 15, lines 4-16).

66. Claim 36 is essentially similar to Claims 8, 22, and 25 and is rejected for the reasons stated above apropos to Claims 8, 22, and 25.

67. Regarding Claim 40, Finn as modified discloses a filter adjuster to adjust an inhibiting filter to inhibit the undesired feedback by providing a set of filter coefficients, the filter adjuster comprising: a modeler receptive to a feedback indicator parameter, the input signal, and an output signal to model at least one response of the feedback path when the feedback path is probed with the narrowband subaudible audio probe signal at a predetermined frequency, wherein the modeler provides at least one sample that is representative of the at least one response of the feedback path (Figs. 7 and 8; column 15, lines 4-36)

68. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 20020044667 to Stott et al. (hereafter as Stott).

69. Regarding Claim 1, Stott discloses a method of processing audio signals (Fig. 7), comprising inhibiting at least one feedback component of an input audio signal by adjusting a feedback-inhibiting filter (Fig. 7; page 3, paragraph 0047-0053) using a narrowband probe signal (70)(abstract; Fig. 7). Stott does not expressly the narrowband probe signal being subaudible. However, the Examiner takes Official Notice that it would have been obvious to one having ordinary skill in the art to have the narrowband probe signal be subaudible in order to reduce undesired signals heard by the user. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Stott to provide a subaudible narrowband probe signal in order to reduce undesired signals heard by the user.

Allowable Subject Matter

70. Claim 46 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

71. Claims 24, 26-27, 30-33, 35, 37-39, 41-45, and 47-50 are allowable if Applicant overcomes the Double Patenting rejection set forth in this Office Action.

Response to Arguments

72. Applicant's arguments filed 11/14/2005 have been fully considered but they are not persuasive.

73. With respect to Applicant's argument on page 12, stating that "since co-pending U.S. Application No. 10/732,915 has not issued as a patent, Applicant request withdrawal of these rejections of claims 1-50 and allowance of these claims", has been noted. However, the Examiner respectfully disagrees. See MPEP 804.

74. With respect to Applicant's argument on page 13, stating that "Applicant cannot find in Kandel where processing filter 120 is adjusted by the received signal. Processing filter 120 processing a signal does not teach or discloses adjusting processing filter 120 using a subaudible narrowband probe signal. Therefore, since Kandel does not teach each and every claim element arranged as in claim 1", has been noted. However, the Examiner respectfully disagrees. Kandel discloses "signal processing circuit includes the sensor 118 and a processing filter 120 which transmit a feedback, and preferably a negative feedback, signal from the ear cavity to the amplifier 114 via mixer 113. In this, these components provide a way of stabilizing the signal processing circuit and preventing regenerative oscillation of processed amplified audio signals". The processing filter 120 receives signals from the sensor 118, wherein the sensor generates signal representative of "the air vibrations of its environment occasioned by the earphone or loudspeaker 117 output, vibrations of the eardrum in the ear cavity 119 in response to the earphone's output, and to any oto-acoustic emission that derives from the ear itself", where the signals from the loudspeaker 117 comprises the injected

tone T (i.e. narrowband subaudible probe signal) in order to produce a negative feedback (i.e. adjusting a feedback-inhibiting filter using a narrowband subaudible probe signal) which is transmitted to the mixer 113 (i.e. inhibiting at least one feedback component of an input audio signal) which provides a way of stabilizing the signal processing circuit and preventing regenerative oscillation of processed amplified audio signals. See Fig. 4; column 5, line 57 to column 6, line 5; column 6, lines 19-24; column 9, lines 50-57; column 10, lines 12-25; column 12, lines 1-4.

Applicant's arguments with respect to claim 1-50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

75. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5717772 to Lane et al. discloses method and apparatus for suppressing acoustic feedback in an audio system.

U.S. Patent No. 5920633 to Yang discloses thin-wall multi-concentric cylinder speaker enclosure with audio amplifier tunable to listening room.

U.S. Patent No. 5331299 to Smith discloses adaptive tracking notch filter system.

76. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey P. Chau whose telephone number is (571)272-7514. The examiner can normally be reached on Monday - Friday 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 6, 2006
CPC

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